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Notice of Allowability	Application No.	Applicant(s)	
	10/782,634	FREITAS ET AL.	
	Examiner	Art Unit	
	David Silver	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed 10/31/2007.
2. ☒ The allowed claim(s) is/are 1-11.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ 7. <input type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____ |
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KAMINI SHAH
SUPERVISORY PATENT EXAMINER

DETAILED ACTION

1. Claims 1-11 are allowed over the prior art of record.

Allowable Subject Matter

10. Claims 1-10 allowed.

11. The following is an examiner's statement of reasons for allowance:

The art of record, individually or in combination, fails to suggest or render obvious the specific arrangement of the claimed invention as recited in the claims and disclosed in the Specification.

The most relevant prior-art of record is **Rudman's "A volume-tracking method for incompressible multifluid flows with large density variations"**.

Rudman teaches A method for tracking the flow of N materials and their interfaces in a computational domain, the method comprising the steps of:

(a) creating a macrogrid including control volumes on a computational domain in which N materials and their interfaces are to be tracked (page 360); (b) overlaying a microgrid including microgrid cells upon the macrogrid with each of the microgrid cells being coupled to a control volume (page 361 fig 1); (c) initializing the macrogrid and control volumes with initial and boundary conditions (page 360 para 1); (d) assigning a unique identifier to each of the N materials and to the microgrid cells (page 359 equation 2); (e) calculating volume fractions for the N-materials in the control volumes (page 372 last para); (f) solve equations of motion upon the macrogrid and control volumes utilizing the calculated volume fractions to arrive at local velocity conditions for the control volumes (page 359 para 1); (g) advecting the microgrid cells within the microgrid in response to the calculated local velocity conditions in the control volumes such that voids and overlaps of the microgrid cells in the microgrid occur (page 359 para 1; page 360 last para; page 358 para 1); (h) reallocating the microgrid cells so that only one material is in each microgrid cell to effectively conserve mass and satisfy local fluid fraction gradient values (page 357 Summary, page 358 last para, page 360 last para); and (i) repeating steps (e)-(h)

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until a satisfactory number of time steps has occurred to complete the simulation (page 374 last para; page 360 para 1).

Rudman however does *not* expressly disclose (emphasis added): "(g) advecting the microgrid cells within the microgrid based on in response to the calculated local velocity conditions in the control volumes such that voids and overlaps of the microgrid cells in the microgrid occur;

(h) calculating whether voids and overlaps are present is calculated using a product of the unique identifiers".

Claim 8 is allowable for similar reasons as provided above.

The art of record, either individually or in combination, fails to teach, suggest, or render obvious invention having the corresponding function that is claimed. In view of the foregoing, the Instant Claims of the present application are found to be patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Claims 1-11 are found allowable over prior-art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 10am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ds/

David Silver, Patent Examiner
Art Unit 2128



KAMINI SHAH
SUPERVISORY PATENT EXAMINER